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Effects of hydrogen sulfide on the processes of exo- and endocytosis of synaptic vesicles in mouse motor nerve endings

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Abstract

The effects of sodium hydrosulfide(NaHS),the donor of hydrogen sulfide(H2S),on the exo-endocytosis cycle of the synaptic vesicles in the motor nerve ending of mouse diaphragm were explored using intracellular microelectrode technique and fluorescent microscopy. NaHS increased the frequency of miniature end-plate potentials(MEPPs) without changing its amplitude-time parameters and the amplitude of the postsynaptic responses undersingle stimulus condition(0.3 Hz),giving evidence on enhancing synaptic vesicle exocytosis. During high-frequency stimulation(50 Hz) NaHS induced more significant decline of neurotransmitter secretion,which can be due to the lower rate of synaptic vesicle mobilization from the recycling pool to the exocytic cites. NaHS also decreased the uptake of the fluorescent endocytic dye FM 1-43, which indicates the reduced endocytosis of the synaptic vesicles. Thus,the donor of H2S increased exocytosis and decreased the processes of the synaptic vesicles' endocytosis and mobilization in the mouse motor nerve ending.